

REMARKS

Applicants amended claims 1, 22, 36, 41, 57, 59, 61-62, 64. Support for the amendments can be found, for example, at page 11, lines 1-5 and at page 7, lines 5-12 of the application as filed. Claim 65 is new and is supported by Table 3 at page 11 of the application as filed. Claim 65 will be discussed below. Should there be any issues with the amended claims, the Examiner is respectfully invited to telephone the undersigned to discuss the amendments.

Claims 1-20, 22-25, 27-34, 36-39, 41-50, and 52-65 are presented for examination.

Interview Summary

Applicants thank the Examiner for extending the courtesy of telephonic interview on July 30, 2008 to discuss claims 22 and 36. During the interview, Applicants explained that pulling and leveling an expanded metal grid refer to two different steps in a method of making a cathode, and that pulling the grid does not simultaneously level the grid. Applicants noted that, for example, in Table 3 (application, page 11), two grids having the same initial foil thickness, strand width, and LWD were subjected either to pulling or leveling. After pulling, the SWD was 71.6 mils, the LWD decreased from 100 mils to 80.3 mils, and the strand width decreased from 10 mils to 9.1 mils. In contrast, after leveling, the SWD was 51.2 mils, the LWD was 99.6 mils, and the strand width increased from 10 mils to 10.6 mils. The Examiner agreed that leveling and pulling refer to different processes, and indicated that claims 22 and 36 would likely be allowable if Applicants amended these claims to require that leveling comprises a different step compared to pulling the grid.

Specification

The Examiner objected to the title of application allegedly for not being descriptive. Applicants amended the title to obviate this objection and respectfully request that this objection be withdrawn.

35 U.S.C. §103

The Examiner rejected claims 1-20, 22-25, 27-34, 37-39, 41-50, and 52-64 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5, 543,249 (“Takeuchi”) in combination with U.S. Application Pub. No. 5,543,249 (“Michel”), further in combination with “Candidate material for the sulfur electrode current collector”, Corrosion Science, Vol. 26, No. 5, pages 377-388, 1986 (“Tischer”); and still further in combination with U.S. Patent No. 5,554,463 (“Marincic”) (a) alone, or (b) further in combination with U.S. Patent No. 6,447,957 (“Sakamoto”).¹

Takeuchi, Michel, Tischer, and Sakamoto were discussed in Applicants’ previous responses dated March 4, 2008 and December 10, 2008, herein incorporated by reference. In brief, none of Takeuchi, Michel, Tischer, or Sakamoto, discloses or suggests the methods covered by claims 1-20, 22-25, 27-34, 37-39, 41-50, and 52-64, and there is no suggestion to combine these references to provide the methods covered by these claims. Further, even if the references were combined, the resulting methods still would not be the subject matter covered by the claims. Specifically, Takeuchi discloses an expanded metal grid formed of titanium or aluminum, but does not disclose either pulling or leveling an expanded metal grid including aluminum and an array of diamond-shaped openings. Michel, Tischer, and Sakamoto do not cure Takeuchi’s deficiencies, at least because Michel, Tischer, and Sakamoto do not disclose or suggest pulling a grid having an array of diamond-shaped openings along a direction other than along the length of any of the boundary elements to increase the short dimension of the openings and increase the tensile strength to greater than 5 lb/in, nor do these references disclose leveling a current collector prior to coating by passing the current collector through rollers.

In the latest Office Action dated February 25, 2008, the Examiner conceded that Takeuchi in combination with Michel further in combination with Tischer fail to teach pulling along a direction other than the length of any boundary of the diamond shaped grid. (Office action, page 5, 2nd full paragraph). However, the Examiner cited Marincic, specifically to FIG. 1 and Column 2, lines 6-18, and asserted that since Marincic teaches a current collector for electrochemical cell whereby a current collector having diamond-shaped grid is pulled or

¹ Applicants respectfully note that claim 36 is pending but appeared to have been inadvertently omitted in the Office Action dated May 1, 2008. Applicants submit that the current response to the rejection under 35 U.S.C. §103 is also relevant for claim 36.

stretched along a direction other than the length of any boundary of the diamond shaped grid, it would have been obvious to modify Takeuchi in combination with Michel further in combination with Tischer. Applicants respectfully disagree.

Marincic discloses an expanded screen current collector with coined side edges to prevent sharp tines along the side edges. (See, e.g., Marincic, Abstract.) But Marincic describes **conventional** expanded screen current collectors. For example, referring to FIG. 1 and the paragraphs at column 1, line 64 – column 2, line 18 (portions of which were also cited by the Examiner):

One **commonly employed** current collector is an expanded screen wherein a flat, thin sheet of electrically conducting material, such as stainless steel, titanium or aluminum, is partially cut in numerous places along a direction extending between opposing side edges. Thereafter, the current collector is pulled or stretched along a direction perpendicular to the cutting direction to expand the collector material and thereby yield a structure having a substantial surface area for receiving cathode material.

FIG. 1 illustrates a **conventional expanded screen** current collector 10. Arrows 12 and 14 indicate the direction along which the material is pulled or stretched to achieve the expanded configuration as illustrated. (Emphasis added).

Marincic's application starts with such a conventional expanded screen, made from pulling a **flat** sheet having numerous cuts in the sheet, and improves upon it by bending or coining inwardly the opposing side edges of the expanded screen so as to avoid sharp tines in the current collector. However, Marincic does not disclose or suggest **further** pulling such a conventional expanded screen, as required by claims 1-20, 22-25, 27-34, 37-39, 41-50, and 52-64. Neither does Marincic disclose or suggest leveling such a conventional expanded screen between rollers, as differentiated from pulling, discussed above. Therefore, Marincic does not cure the deficiency of Takeuchi, which also discloses an expanded metal grid but does not disclose either pulling or leveling the expanded metal grid. Therefore, none of Marincic, Takeuchi, Michel, Tischer, or Sakamoto, discloses or suggests the methods covered by claims 1-20, 22-25, 27-34, 37-39, 41-50, and 52-64, and there is no suggestion to combine these references to provide the methods covered by these claims. Further, even if the references were combined, the resulting methods still would not be the subject matter covered by the claims.

For at least these reasons, Applicants respectfully request that the § 103(a) rejection of claims 1-20, 22-25, 27-34, 37-39, 41-50, and 52-64 be withdrawn.

Finally, new claim 65 has been added, which Applicants believe is patentable for additional reasons. For example, claim 65 requires pulling an expanded metal grid to provide a pulled expanded metal grid having an increase in a short dimension of diamond-shaped openings in the expanded metal grid, an increase in a tensile strength to greater than 5 lb/in, and a decrease in a strand width of a boundary element. None of the cited references, alone or in combination, disclose or suggest the subject matter of claim 65. Therefore, Applicants respectfully request that claim 65 be allowed.

Applicants believe the claims are in condition for allowance, which action is respectfully requested.

No fee is believed to be due. Please any other charges to deposit account 06-1050, referencing Attorney Docket No. 08935-291001.

Respectfully submitted,

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